# Atlantic Richfield Company

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**VIA FEDEX AND EMAIL**

Jeryl Gardner, P.E., C.E.M.
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**Subject: Anaconda Copper Mine Site, Yerington, LyonCounty, Nevada**
**Comments on Proposed Plan for Operable Unit 8**

Dear Jeryl:

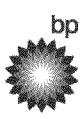
Atlantic Richfield Company ("ARC") submits the attach ed comments on the Proposed Plan for Operable Unit 8 ("OU-8"), which U.S. EPA distributed to community members and stakeholders by email on November 10, 2016. Public comments are being accept ed through December 21, 2016. ARC requests that these comments and all responses prepar ed by U.S. EPA, the Bureau of Land Management ("BLM"), and/or the Nevada Division of Environmental Protection ("NDEP") (collectively, the "Agencies") be included in the responsiveness summary ma de available with the record of decision for OU-8 and in the Administrative Record for the Anaconda Copper Mine site (the "Site").

ARC generally supports the Agencies' preferred remedial alternative for OU-8, which contains the heap leach pads ("HLPs") formerly operated by Arimetco, associated ponds, and the fluid management system ("FMS"). We agree that on-site source control should be the primary focus, at least initially, for the site-wide remedial action. As described in the Feasibility Study, the OU-8 remedial action is likely t o proceed in a phased approach. ARC believes it is impo rtant that the OU-8 remedial action be designed and implemented consistent with the reasonably anticipated range of response actions to be selected for other portions of the Site, particularly in spatially adjacent operable units. It will be more effective and efficient to plan and implement grading, capping, flu id and stormwater management, and other OU-8 remedial action steps in a phased manner and optimal sequence that fully considers reasonably anticipated remedial action work in other operable un its. Along these lines, the initial OU-8 constructio n phase should, at a minimum, include installation of final FMS ponds that allow for long-term management of drain-down fluids without the need for building and maintaining interim or temporary management facilities.

Certain modifications to the proposed slope grades, cover parameters, fluid management plans, and other technical specifications described in the Prop osed Plan may also be warranted. Although some of these modifications are discussed in the attach ed comments, we recognize that these and other design details will not be finalized until the remed ial design stage of remedy implementation. In addit ion, availability of materials, haul distances, topology, construction progression, and other engineering factors should be considered when deciding how, when, and in what sequence the remedial action takes place. By systematically planning and implementing the OU-8 re medial action within a site-wide context, rather than requiring that the work adhere to existing OU-8 boundaries, we believe efficiency, cost-effectiveness, and time-to-completion can be improved for OU-8 and the Site as a whole.







ARC appreciates the Agencies' careful consideration of these comments as it completes the OU-8 Proposed Plan and remedy decision process. Please contact me if you have any related questions.

Sincerely,

Jack Oman
Project Manager

cc: David Seter, U.S. EPA
Harry Ball, U.S. EPA
Dante Rodriguez, U.S. EPA
Chris Dirscherl, U.S. EPA
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Nathan Block, Atlantic Richfield Company
Patricia Gallery, Atlantic Richfield Company
Brian Johnson, Atlantic Richfield Company
Adam Cohen, Davis Graham & Stubbs
Dan Ferriter, Copper Environmental

## GENERAL COMMENTS

**Comment G1:** Coordinated Response. Implementation of the OU-8 remedial action should proceed in coordination with remedial action in adjacent portions of OU-3, OU-4a, and OU-5 to maximize efficiency of material handling and reduce the need for multiple mobilizations. Some examples of how this recommended coordinated closure approach would occurinclude:

(i) Export excess HLP material made available from down-grading of the Phase III-South HLP into OU-3 for use in in filling/covering the OU-3 concrete vaults and the adjacent OU-8 Mega Pond. Both areas can be lined, graded, covered, and closed together as a single closure management unit. Also export excess material from down-grading of the Phase III-South HLP to the adjacent Phase III-4X HLP to achieve desired side-slope conditions.

(ii) Import material from the OU-5 W-3 and S-23 waste rock areas into OU-8 to provide fill, achieve desired side-slope conditions, and provide a working base for installing cover material on the Phase I and Phase II HLPs. Concurrently export material from re-grading of the W-3 waste rock area (to 3:1 slopes) to serve as cover material on infrastructure within the southern portion of OU-3. Construct fluid management and stormwater management ponds associated with the HLPs within the flat space created from the re-graded W-3 and W-23 waste rock areas. Close the entire area, encompassing the Phase I/II HLPs, W-23, W-3, and South OU-3 process area, as a single closure management unit.

Additional synergies can be identified as the RI/FS work is completed for the other operable units.

**Comment G2:** Construction Sequencing. Remedial action in OU-8 (and in adjacent portions of other operable units) should be sequenced to take maximum advantage of the efficiencies derived from fewer mobilizations and utilization of on-site materials for filling, contouring, and capping. Construction of new evaporation ponds associated with the Phase I, II, III-South, III-4X, and IV-Slot HLPs should occur first. Grading and capping should occur next for these HLPs, in coordination with closure activities for adjacent portions of OU-3 and OU-5 (as discussed above). Grading and capping of the Phase IV-VLT HLP should be coordinated with later closure work in the adjacent OU-4a area (including the Finger Ponds, Thumb Pond, and Lined and Unlined Evaporation Ponds).

**Comment G3:** Regrading and Expanded Footprint. Re-grading plans for the HLPs should allow for greater push-down of HLP leach material or over dumping with imported materials, which will result in an expanded footprint in certain areas to achieve desired side slopes and to provide more manageable cap areas and working space. This will improve implementability, since the need for relocating material up-slope onto the top of HLPs will be reduced; and more gradual side slopes (3:1 rather than 2.5:1), which will facilitate cover installation, may be accommodated. For example, designs should provide for push-down of material on the east-facing slopes of the Phase III-South and Phase III-4X HLPs and the east-facing slope of the Phase IV Slot HLP towards the south and east, respectively. In some cases, materials derived from OU-8 facilities may need to be pushed-down or otherwise moved outside the designated OU-8 boundaries to achieve design specifications and the desired construction efficiencies. Mining materials (spent ore) may be considered for use or disposal outside of permitted containment if

determined not to pose a threat to surface water or groundwater in accordance with guidance issued by the Nevada Bureau of Mining Regulation and Reclamation ("NBMRR").[1]

**Comment G4:** Fluid Management and Pond Construction. With respect to fluid management, ARC agrees that precipitates in the existing evaporation ponds (including the 4-acre Pond) should be closed in place to the greatest extent practicable and in accordance with applicable regulatory closure requirements. ARC does not agree, however, that the existing FMS ponds in their current configuration should be converted to E-Cells for long-term fluid management. Instead, drain-down fluids can best be managed by (i) coordinated, phased closure of the existing ponds based on derived fluid drain-down rates, and (ii) constructing new decentralized evaporation ponds as an interim measure or initial step in remedial action implementation, with one pond to be installed adjacent to each of the Phase I/II, III-South, III-4X, and IV-Slot HLPs. Ponds could be constructed in 2018-2019, prior to initiating final grading and capping of the associated HLPs. This will help to ensure continued effective management of drain-down fluids and reduce or eliminate the risk of exceeding FMS pond capacities while the RI/FS, remedy selection, remedial design, and remedial action proceed to completion. By having separate, decentralized ponds associated with each HLP, fluid management strategies can be optimized using passive drainage and without the need for extensive pumping and transfer of liquids, thus increasing operating efficiency. As drain-down fluid rates decrease, ponds would be converted to E-Cells for long-term operations and maintenance at the point that in-flow rates drop below 1.5 gpm. Ponds would also be constructed of suitable dimensions and base materials to facilitate solids management while operating in the evaporation mode and efficient conversion to E-Cells at the appropriate time.

**Comment G5.** Source(s) of Fluid Generation. The Proposed Plan states (on p. 2) that the "remedy is recommended because it will achieve substantial drain-down fluid reduction by addressing the source of the fluid generation (infiltration of precipitation) through capping the HLPs, which will significantly reduce volumes and flowrates of fluids to manage." This is not entirely accurate. Certainly, regrading, capping, and run-on controls on the HLPs will reduce precipitation-derived infiltration and resulting drain-down fluid discharge rates to some degree. However, there is a substantial reservoir of fluid in the HLPs, which will continue to drain down and discharge regardless of future reductions in precipitation infiltration. It will be important for the evaporation ponds and other fluid management system components to be designed and constructed with due consideration of the volume and projected drain-down rates of the residual fluid present within the HLP interstices.

**Comment G6.** Estimated Costs. The Proposed Plan includes estimated NPV costs for the preferred alternative, but little information is provided concerning how the cost estimates were derived. ARC has carefully evaluated the Agencies' cost estimates and finds them to be well below ARC's own estimates for the OU-8 remedial action. This is due in part to the exclusion of estimated costs for (i) closing the existing 4-acre pond, and (ii) long-term operation, maintenance, and possible replacement of the other FMS ponds. Other items that appear to have been excluded from the Proposed Plan's cost estimates are structure demolition, closure planning, and management of OU-8 surface soils located outside of the HLPs. In addition, some cost items, although included, appear to underestimate likely projected costs (*e.g.*, pond closures and pond construction). Based on ARC's analysis of the Agencies' current closure plan, estimated costs for the preferred remedial alternative are in a median range of approximately $59.6 million.

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[1] *See* https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwjQ4N6rg_zQAhXHg1QKHa-KDIIQFggdMAA&url=https%3A%2F%2Fndep.nv.gov%2Fbmrr%2Ffile%2Freuse.pdf&usg=AFQjCNFp3vb6_O1u0F6s__fArjsXr9iX_Q&bvm=bv.142059868,d.cGw

**Comment G7:** Stormwater Management. ARC agrees that integrated stormwater management, including segregation of non-contact stormwater from drain-down fluids, is a key component of the site-wide remedial action. As stated in the Proposed Plan, stormwater management features associated with OU-8 should "be designed and constructed with the long-term objective of connecting to and complementing site-wide stormwater management features in adjacent areas of the site." The design of the OU-8 stormwater basins, ditch networks, and other conveyances should occur as part of the development of the site-wide storm water management plan. This will best ensure that stormwater continues to flow by passive drainage in the intended direction and that stormwater management system facilities will not need to be removed, rebuilt, or redesigned as the remedial action proceeds in other parts of the Site. Stormwater drainage plans need to be consistent with the projected final Site topography in order to avoid costly excavation work and minimize the need for tunneling and active pumping. For example, it may not be possible to direct stormwater collected at the Phase I/II HLPs towards the north, because this area is topographically lower than the intersecting Burch Drive. Also, it appears from Figure 6 in the Proposed Plan that the Agencies' conceptual stormwater management plan will include three non-discharging detention basins (numbers 1, 2, and 4), and one retention basin discharging to the pit. It is unclear whether the detention basins are intended to rely on evaporation, infiltration, or other means for eliminating collected stormwater. ARC recommends designing stormwater management facilities that will allow for sufficient water retention to promote settling and separation of suspended sediments, but also include mechanisms for discharging non-sediment bearing water off-site. This will help to reduce the needed surface area and detention capacity of the ponds, as compared to a system relying exclusively on evaporation for water elimination. In addition, developing a holistic, site-wide stormwater management plan is consistent with the recommended phased approach for the OU-8 remedial action. Addressing the immediate need for stormwater and drain-down fluid management ponds will allow for other aspects to be phased with the broader remedial action in a systematic, cost effective way that is more sustainable over the long-term.

**Comment G8.** Use of "Evapotranspiration (E/T)" Soil Caps. The Proposed Plan refers in several places to the use of evapotranspiration (ET) soil caps in the OU-8 remedial action. This implies that the Agencies envision seeding and active management of vegetation on the closed/capped HLPs to enhance water removal and reduce infiltration, although this is unclear. Use of non-vegetated covers may be more appropriate given the climatic conditions at the Site. Average annual precipitation is less than 5.2 inches (WRCC-DRI). Annual average pan evaporation exceeds 60 inches (PE, WRCC-DRI Fallon), with variable seasonal wind conditions typically averaging below 10 mph. The climate thus appears suitable for an evaporation-only soil cover alternative. Climate conditions may be too dry to passively support a desirable vegetation habitat, as needed to meet transpiration or erosion control performance goals. Whether ET covers or non-vegetated covers provide the most effective water balance cover method can be resolved at the remedial design stage of remedy implementation.

## SPECIFIC COMMENTS

- **Comment S1: P.3, 1st column, Mine History, 5th sentence:** The Proposed Plan states that: "Atlantic Richfield Company (ARC) acquired the Property from the Anaconda Copper Mining Company in June 1978 and terminated mining operations at the Site." This is not factually correct. Anaconda ceased mining operations at the Site in June 1978. Anaconda merged with an ARC subsidiary in 1977 (renamed The Anaconda Company), which was merged into ARC in 1981.

- **Comment S2: P.3, 2nd column, 1st paragraph, 3rd sentence:** The Proposed Plan states that: "The solution drain-down rate decreased from 3,300 gpm during active operation to less than 35 gpm in 2002." These figures appear to pertain only to the Phase IV VLT HLP. Available information suggests that site-wide drain-down flow rate values were substantially higher during this time. Correct estimates of historic drain-down flow rates are important for accurately projecting future, long-term flow

rates using applicable modeling techniques and for ensuring proper sizing and design of fluid management facilities.

- **Comment S3: P. 3, 2nd column, 2nd paragraph, last sentence:** The Proposed Plan states that enhanced evaporation methods pilot tested by SPS in 2016 "may potentially reduce the fluids and solids in the FMS, providing additional time to secure Superfund or other funding sources for design and construction of the approved remedy." ARC is concerned that enhanced evaporation may increase the leachability of certain constituents from the HLP materials, which could affect the suitability of those materials for use or placement outside of areas of containment under the NBMRR Guidance (*see* Comment G3, above). These effects should be thoroughly assessed and considered before implementing enhanced evaporation on a larger scale on any of the HLPs.

- **Comment S4: P. 3, 2nd column, Drain-Down Fluid Characteristics, 1st sentence:** The Proposed Plan states that: "There are currently five ponds collecting hazardous drain-down fluids from the HLPs with a total design capacity of approximately 14.54 million gallons." The current capacity of the VLT Pond, Evaporation Ponds B and C, Phase I/II Pond, and Slot Pond II is actually 10.54 million gallons. The higher fluid capacity estimate stated in the Proposed Plan was presumably determined before the Slot Pond I, the Mega Pond and the Arimetco Process Facility Ponds were closed in 2006.

- **Comment S5: P. 5, 1st column, 1st paragraph, 2nd sentence:** The Proposed Plan states that OU-2, OU-4b, OU-5, and OU-6 pose less risk than the "highest priority" OUs (OU-1, OU-3, OU-4a, OU-7, and OU-8), and "work on these OUs will proceed once the priority OUs have finalized the RI and FS, Human Health Risk Assessments, Proposed Plans, and Records of Decision (RODs), and remedial actions have begun." As noted in Comments G1 - G4 above, ARC believes that it is appropriate to begin work in some of the other "lower priority" OUs sooner rather than later and to coordinate that work with the remedial action proposed for OU-8 for a more efficient and holistic site-wide remedial approach. Again, this will improve overall efficiency, reduce costs, and decrease the time-to-completion for the site-wide remedial action.

- **Comment S6: P. 6, 1st column, "Is the Site Safe?" 1st paragraph:** The Proposed Plan reports on incremental cancer risk estimates and non-cancer hazard indices for exposure to OU-8 HLP materials. These estimates are based on the Human Health Risk Assessment ("HHRA") completed as part of the OU-8 RI/FS. They are derived from highly conservative exposure assumptions and risk estimation methods, and they intentionally overestimate reasonably anticipated exposures and the associated risks. As stated in U.S. EPA's Final Remedial Investigation Report for OU-8 (Sept. 2011) (Section 8.4, p. 8-2):

> "The screening-level HHRA conservatively estimates potential risks to human receptors. Drain-down solution was compared to drinking water MCLs and tap water PRGs; however, it is not expected that drain-down solution would be ingested. The use of these conservative comparison criteria overestimate the potential exposures and associated risks from drain-down solution."

This uncertainty and the associated over-estimation of exposure risk should be acknowledged in the Proposed Plan.

- **Comment S7: P. 7, 2nd column, 1st paragraph, 2nd sentence:** The proposed Plan states that: "past releases and potential future releases from OU-8 … also have the *potential* to contaminate groundwater…." Use of the term "potential" here is not completely consistent with the findings of the RI/FS, which attribute measured groundwater impacts to Arimetco's OU-8 operations. For example, U.S. EPA's "Feasibility Study for Arimetco Facilities, Operable Unit 8" (Oct. 2016) states on page 1-13 that: "Potential areas affected by Arimetco operations include the footprints of each HLP and

their associated drain-down FMSs, historical spill areas, and the SX/EW Process Area. On the basis of groundwater monitoring results, these impacts are thought to extend vertically down to groundwater…."

- **Comment S8: P. 13, 2nd column, Preferred Alternative, 2nd paragraph, 4th sentence:** The Proposed Plan states that: "[The preferred Alternative 4] also more closely adheres to NDEP Bureau of Mining Regulation and Reclamation closure requirements and guidance, which are required at active, permitted mines in Nevada." ARC agrees that NBMRR closure requirements and guidance should be used in determining closure requirements and the remedial action design.